Intra-segmental timing in sound change: /aw/ in Philadelphia

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Intra-segmental timing in sound change /aw/ in Philadelphia

Intro
Philadelphia (Labov et al 2013)

- 1900 /aw/ raising and fronting
- 1950 /aw/ lowering and backing

Assumes /aw/ is a 2-part diphthong. Only describes the movement of the "nucleus" of the diphthong.

Formant Trajectories
Have been investigated with generation as a categorical variable. Jacewicz, Fox & Salmons (2011)

Wholistic measures compared against continuous variables. Rudal & Kohn (2014)

With GAMs, it is possible to model trajectories against continuous variables. Wood (2006)

Methods

Data
Philadelphia Neighborhood Corpus 19,517 tokens of preural /aw/ 279 white speakers

Modelling
Generalized additive models & tensor product smooths outcome (F1)

Predictors
All non-linear effects and interactions between - gender - log2(duration) - date of birth - measurement point

FAVE-extract
Full formant tracks extracted Subsampled to 20 measurements per token

Results

formant tracks
falling F2 & single F1 excursion at midpoint (diphthong?)

max F1 excursion
Timing of F1 maximum shifts diachronically

Target of F1 maximum is more stable.

vowel space trajectories
They interact with duration differently over time

F1 relative to F2
Delayed F1 maximum keeps F2/F1 difference larger for longer.

Conclusion

It is not straightforward to characterize /aw/ as a 2-part diphthong in Philadelphia.

Along with the shifts in vowel quality, there is a considerable shift in relative timing of vowel formant targets.

This puts /aw/ in line with some consonantal phonetic changes, such as Scottish derhoticization or Andalusian post-aspiration.

Further directions

Evaluating and improving quality of automated full formant track extraction.

Incorporating more linguistic (nasals) and social (education) factors into analysis.

Are the F1 and F2 qualities used differently for linguistic or sociolinguistic perception?

References


